EXHIBIT 2

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571-272-7822

Paper 11
Date: September 18, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASIMO CORPORATION,
Petitioner,

v.

APPLE INC.,
Patent Owner.

IPR2023-00635
Patent 10,987,054 B2

Before KEN B. BARRETT, JOSIAH C. COCKS, and ROBERT L. KINDER, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background and Summary

Masimo Corporation ("Petitioner")[1] filed a Petition requesting *inter partes* review of U.S. Patent No. 10,987,054 B2 ("the '054 patent," Ex. 1001). Paper 1 ("Pet."). The Petition challenges the patentability of claims 1–20 of the '054 patent. Apple Inc. ("Patent Owner")[2] filed a Preliminary Response to the Petition. Paper 8 ("Prelim. Resp.").

An *inter partes* review may not be instituted "unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a) (2018). Having considered the arguments and evidence presented by Petitioner and Patent Owner, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the '054 patent. Accordingly, we do not institute an *inter partes* review of the challenged claims.

B. Related Proceedings

Both parties identify, as a matter involving or related to the '054 patent, *Apple Inc. v. Masimo Corporation and Sound United, LLC*, No. 1:22-cv-01378-MN (D. Del.). Pet. 1; Paper 4.

C. The '054 Patent

The '054 patent pertains to "techniques for providing, on a watch or other wearable electronic device, electrodes for sensing biological

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[1] Petitioner identifies Masimo Corporation as the real party-in-interest. Pet. 1.
[2] Patent Owner identifies Apple Inc. as the real party-in-interest. Paper 4.

parameters." Ex. 1001, 1:27–30. "The biological parameters may include, for example, an electrocardiogram (ECG) of the user." *Id.* at 1:54–55.

Figure 4A of the '054 patent is reproduced below.

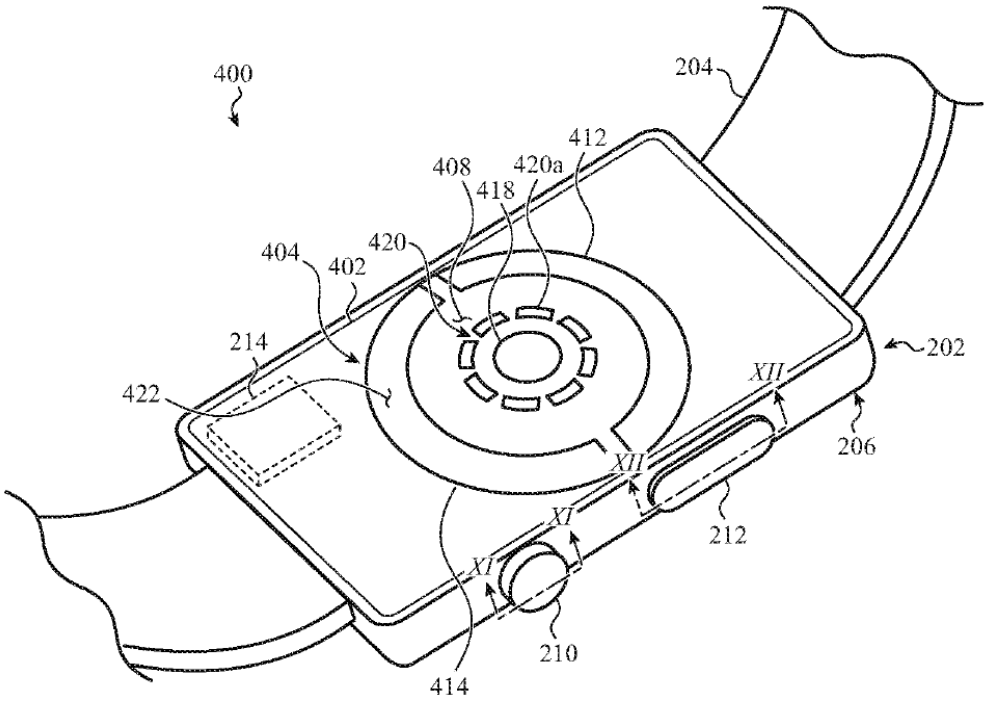


FIG. 4A

Figure 4A depicts an isometric view of the rear face of electronic watch 400 that incorporates a set of electrodes. *Id.* at 12:47–54. "[A] light-transmissive element such as a carrier 404 (e.g., a rear-facing or skin-facing carrier) may be coupled to or otherwise attached to a back side housing member 402 of the watch 400, and in some cases may be considered to form a part of the housing 206 of the watch body 202." *Id.* at 12:64–13:2. As shown in Figure 4A, carrier 404 has a round perimeter and is fitted to a round opening in back side housing member 402. *Id.* at 13:11–13. Carrier 404 may be sapphire crystal or, alternatively, "may be formed from (or replaced by) a light-transmissive element formed of glass, plastic, or another material." *Id.* at 13:21–24.

"The exterior surface 408 of the carrier 404 may have a set of electrodes (e.g., first and second (or rear-facing) electrodes 412, 414) thereon." *Id.* at 13:27–29. "In some embodiments, the electrodes 412, 414 may be PVD deposited on the carrier 404." *Id.* at 13:30–32. "In some cases, the first and second electrodes 412, 414 may be arc-shaped (e.g., semi-circle-shaped), and may be positioned around a central opening 418 and concentric ring of openings 420 formed in the masks 422." *Id.* at 13:42–45. Not shown is element 430, which may represent crown 210 or button 212 on the watch. *Id.* at 14:8–9. The user may touch a conductive portion of element 430 (the third electrode) with a finger while electrodes 412 and 414 contact the user's skin. *Id.* at 14:15–18, Fig. 4B; *see also id.* at 49:49–53 ("[T]he electronic device may include a first electrode 2302 on a carrier 2304, an optional second electrode 2306 on the carrier 2304, and a third electrode 2308 on the surface of a user-rotatable crown 2310 (or alternatively, on the surface of a button)."). The processor of the electronic device may determine a biological parameter of the user, such as an ECG, based on voltages at the various electrodes. *Id.* at 6:49–53.

The device also may contain an optical sensor subsystem 416 that includes one or more light emitters (e.g., LEDs) and one or more light detectors (e.g., photodetectors, such as photodiodes), which may be positioned to emit and receive light through carrier 404. *Id.* at 15:40–46. Optical communication may occur through the carrier, including at openings 418 and 420 formed in masks applied to the carrier. *Id.* at 13:65–14:1. The optical sensor subsystem 416 may be an optical heart rate sensor. *Id.* at 13:39–41.

D. Illustrative Claim

Of the challenged claims of the '054 patent, claims 1, 9, and 15 are independent claims. Claim 9, reproduced below with emphases added, is illustrative.

> 9. A wearable electronic device comprising:
> a rectangular housing member defining a rectangular front opening and a circular rear opening;
> a cover having a rectangular cover profile and positioned over the rectangular front opening;
> a display positioned below the cover;
> *a carrier assembly coupled to the rectangular housing member and comprising*:
> *a carrier member having a circular carrier profile* and positioned over the circular rear opening;
> *a rear electrode positioned on the carrier member* and configured to receive a first voltage signal from a wrist of a user;
> an optical sensor system comprising:
> an optical emitter positioned below a first region of the carrier member; and
> an optical receiver positioned below a second region of the carrier member;
> a side electrode positioned along an exterior of the rectangular housing member and configured to receive a second voltage signal from a finger of the user; and
> a processor positioned within the wearable electronic device and configured to determine a biological parameter using the first and second voltage signals.

Ex. 1001, 57:11–35 (emphases added).

E. Evidence

Petitioner relies on the following references:

Name	Reference	Exhibit(s)
Rothkopf	US 2016/0058375 A1, published March 3, 2016	1005
Jung	US 2016/0228064 A1, published Aug. 11, 2016	1006
Paulke	WO 2017/165532 A1, published Sept. 28, 2017	1007

Name	Reference	Exhibit(s)
Pei	US 10,231,629 B1, issued March 19, 2019	1008
Francis	Johnson Francis, *ECG Monitoring Leads and Special Leads*, INDIAN PACING AND ELECTROPHYSIOLOGY J. 16, 92–95 (2016)	1009
Lapetina	US 2016/0073914 A1, published March 17, 2016	1010
Honda	US 6,265,789 B1, issued July 24, 2001	1011

Petitioner also relies on the declaration of Mr. Alan L. Oslan (Ex. 1003) in support of its arguments, and Patent Owner relies on the declaration of Dr. Thomas Kenny (Ex. 2001) in support of its arguments. The parties also rely on other exhibits as discussed below.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §[3]	Reference(s)/Basis
9, 13–15	102(a)(1)	Rothkopf
10	103	Rothkopf, Francis, Lapetina
1–6, 9, 12–17, 19	103	Rothkopf, Jung
7, 20	103	Rothkopf, Jung, Pei
8	103	Rothkopf, Jung, Honda
10–11, 18	103	Rothkopf, Jung, Francis, Lapetina
1–5, 9, 13–16, 19	103	Rothkopf, Paulke
7, 20	103	Rothkopf, Paulke, Pei
8	103	Rothkopf, Paulke, Honda
10–11, 18	103	Rothkopf, Paulke, Francis, Lapetina

[3] The Leahy-Smith America Invents Act ("AIA") includes revisions to 35 U.S.C. §§ 102 and 103 that became effective on March 16, 2013. Because the earliest filed application identified in the '054 patent has a filing date of September 5, 2017 (Ex. 1001, codes (60), (63), 1:5–22), we apply the AIA-versions of 35 U.S.C. §§ 102 and 103.

II. THE PROSECUTION HISTORY

During prosecution, the Examiner, in a First Action Interview Pilot Program Pre-Interview Communication, rejected certain claims as anticipated, finding that Kegasawa "discloses an electronic watch . . . comprising: a rectangular housing . . ., a display . . . ; a carrier (532 in Fig. 15); an optical sensor system . . .; light emitting and receiving devices); first electrode (arc shape 5421 in Figs. 17–18)." Ex. 1002, 114. The Examiner also applied Rothkopf against dependent claim 22, finding that Rothkopf discloses a plurality of light detectors for heart rate monitoring. *Id.*

An interview between the Examiner and the applicant was conducted, with the Examiner summarizing that interview as follows:

> Applicant proposed to further distinguish the structural relationship between the carrier and the electrodes. Applicant pointed out that the novelty of the invention is forming the electrode directly on a carrier substrate formed from glass/sapphire dome. Examiner explained that Kagasawa does not disclose that the electrodes are directly disposed on the carrier substrate and therefore incorporating such feature would overcome the Kagasawa reference.

Ex. 1002, 105.

In response, the applicant amended the claims. *Id.* at 89–100; *see also id.* at 103–104 (Examiner's First Action Interview Office Action Summary reiterating the Kegasawa anticipation rejection). According to the applicant, "[d]uring the call, the rejections were discussed, as well as proposed amendments directed to the concept that electrodes are positioned on a carrier member (e.g., a carrier member that is formed from a transparent material and coupled to a housing member)" and "[t]he Examiner indicated that the proposed amendments would likely overcome the rejections of

record, but that further consideration or search would be required." *Id.* at 95. The applicant amended, for example, application claim 21 (the first then-pending independent claim) by, *inter alia*, adding "a carrier assembly," changing "a carrier" to "a carrier member," and requiring that two electrodes be positioned on that carrier member. *Id.* at 90.

In arguing that the amendment overcame the Examiner's rejection, the applicant pointed to Figure 9A of the application. *Id.* at 97. We reproduce below Petitioner's annotated version of that figure.

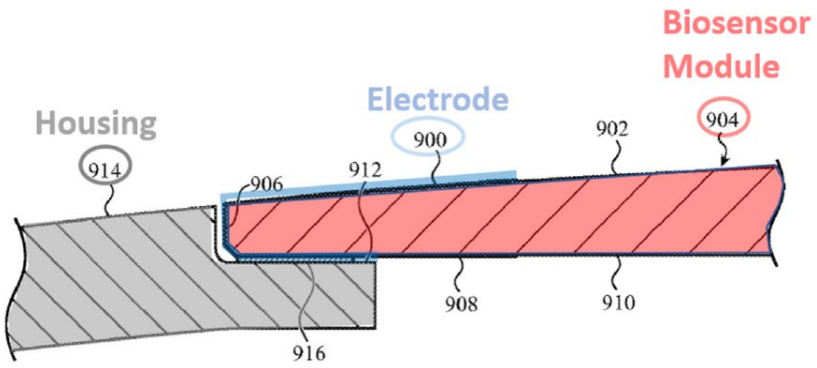


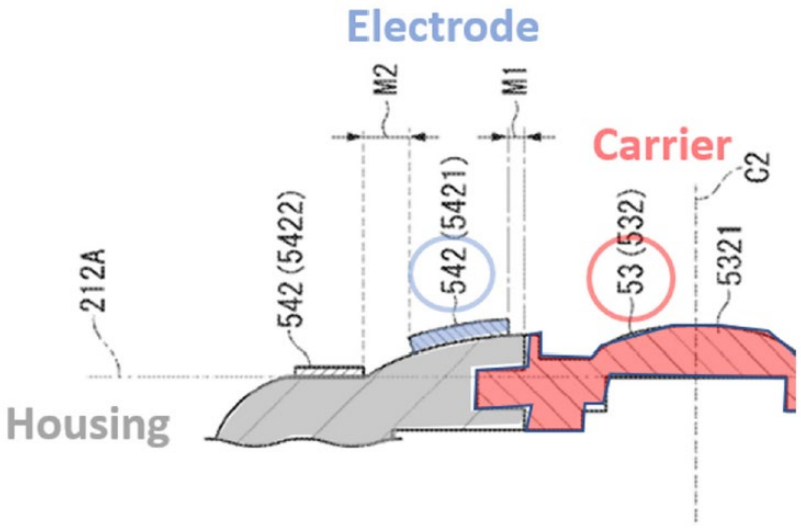
FIG. 9A

Pet. 8. The annotated figure above shows an alternative electrical connection "between an electrode [blue] on an exterior surface of a carrier [red[4]] that forms part of a housing [grey] of an electronic device and an electrical contact interior to the electronic device." Ex. 1001, 2:52–55; Pet. 8. The applicant argued that the figure is "showing how a carrier member (e.g., the 'carrier 904') has electrodes (e.g., electrode 900) positioned thereon, and how the carrier member is a different structural component than the housing member 914 to which it is coupled." Ex. 1002,

[4] Petitioner labels the red portion "Biosensor Module," but the Specification of the '054 patent identifies element 904 in Figure 9A as the "carrier." Ex. 1001, 19:1–2.

97. The applicant included a figure from Kegasawa. *Id.* at 98. We reproduce below Petitioner's rotated and annotated version of that figure.

Kegasawa Fig. 16 (Cited Prior Art)



Pet. 8. The applicant described the Kegasawa figure (annotated above) as "a sensing system in which electrodes [blue] are arranged along various surfaces of the housing [grey], but are not positioned on a component [red] that is analogous to the claimed carrier member (which is a different component than the housing member of [application] claim 21." Ex. 1002, 97–98. According to the applicant, Kegasawa's figure is "showing electrodes 542 positioned along various regions of the housing." *Id.* at 98.

In response to the amendment, the Examiner issued a Notice of Allowability. *Id.* at 46. The Examiner's statement of reasons for allowance includes the following:

> Kegasawa fails to disclose, teach, and/or suggest all the limitations as claimed in amended independent claims 21, 29 and 35. Specifically, Kegasawa fails to disclose, teach, or

> suggest the carrier assembly comprising a carrier member and (first/second or rear) electrode(s) as claimed. As explained by the Applicant, Kegasawa's electrodes (542 in Fig. 16) is a separate component from the carrier assembly (53 in Fig. 16). There would be no motivation to modify the carrier assembly (53 in Fig. 16) of Kegasawa and provide electrodes directly onto the carrier assembly.

Id. at 47.

III. 35 U.S.C. § 325(d)

Patent Owner urges us to exercise discretion under 35 U.S.C. § 325(d) to deny institution of an *inter partes* review. *See* Prelim. Resp. 3–13. Patent Owner argues, *inter alia*, that "Rothkopf—the sole reference for Ground 1 and primary reference for all other grounds—was applied by the Examiner in rejecting the claims during prosecution of the '054 patent," and that "not only does the Petition rely on the same art considered and applied during prosecution, but also presents the same arguments." *Id.* at 5 (citing Ex. 1002, 114–115), 7–8. Because we consider the merits of Petitioner's challenges in this case, and decline to institute a review for the reasons set out below, we need not determine whether it would be appropriate to discretionarily deny institution of the subject Petition under § 325(d).

IV. ANALYSIS OF PETITIONER'S CHALLENGES

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior

art reference." *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see also Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008) (to anticipate a patent claim under 35 U.S.C. § 102, "a single prior art reference must expressly or inherently disclose each claim limitation"). Moreover, "[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements 'arranged as in the claim.'" *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Whether a reference anticipates is assessed from the perspective of one of ordinary skill in the art. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368–69 (Fed. Cir. 2003) ("'[T]he dispositive question regarding anticipation [i]s whether *one skilled in the art* would reasonably understand or infer from the [prior art reference's] teaching' that every claim element was disclosed in that single reference." (second and third alterations in original) (quoting *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991))).

Additionally, under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates. *MEHL/Biophile Int'l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999) (citation omitted); *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349–50 (Fed. Cir. 2002).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4), if present, any objective evidence of obviousness or non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey–Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed.Cir.1986)).

Petitioner contends that:

> A POSITA [person of ordinary skill in the art] of the '054 patent would have had at least a B.S. degree in electrical or biomedical engineering or a related field, with at least two years of experience designing patient monitoring or similar systems. A higher level of education may compensate for less work experience and vice versa.

Pet. 9 (citing Ex. 1003 ¶¶ 31–32).

Patent Owner contends that:

> For purposes of this IPR, Petitioner submits that a person of ordinary skill in the art at the time of the alleged invention (a "POSITA") would have had at least a bachelor's degree in electrical engineering, computer engineering, mechanical

> engineering, biomedical engineering, physics, or a related field, and would have had at least two years of relevant work experience with capture and processing of data or information, including but not limited to physiological information, or equivalents thereof. . . . Less work experience may be compensated by a higher level of education and vice versa.

Prelim. Resp. 13–14 (citing Ex. 2001 ¶ 26).

We discern no material difference between the parties' definitions. Petitioner's definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). For purposes of this decision, we apply Petitioner's definition of the person of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner proposes constructions for "housing member," "carrier assembly," and "carrier member." Pet. 10–12. The parties agree that

Petitioner contends that "carrier member" is a means-plus-function limitation lacking corresponding structure and that Petitioner also offers an alternative construction for that term. Ex. 1051, 48:2–49:2, 50:5–11, 52:2–22 (transcript of the telephonic conference regarding Petitioner's request for authorization to file a preliminary response, with Petitioner asserting that it offered two alternative constructions); Prelim. Resp. 14 ("Masimo asserts that the term 'carrier member[]' . . . should therefore be construed as a means-plus-function term under 35 U.S.C. § 112(f)."); *id.* at 17–18 (Patent Owner referring to "Masimo's proposed alternative construction of 'carrier member' to mean 'a component of a carrier assembly.'"); *see* Pet. 10–12.

Patent Owner, at this stage, does not dispute Petitioner's proposed constructions. Rather, Patent Owner argues that "Masimo has failed to provide a proper construction as required by 37 C.F.R. § 42.104(b)(3) for terms it has identified as means-plus-function terms" and, therefore, institution should be denied. Prelim. Resp. 14. Patent Owner argues that, in addition to "carrier member," Petitioner identified "housing member" as a means-plus-function limitation. *Id.* at 18–19.

We discuss herein Petitioner's proposed constructions of "carrier member." On this record and for purposes of this decision, we determine that no claim terms require express construction.

Carrier Member

As mentioned above, the parties agree that Petitioner contends that "carrier member" is a means-plus-function limitation governed by 35 U.S.C. § 112(f). *See* Ex. 1051, 48:2–49:2; Prelim. Resp. 14. The Petition states the following:

> With regard to "carrier member," Courts have construed "member" style claim terms as nonstructural, and accordingly,

> courts require such terms to be construed according to 35 U.S.C. §112(f). . . . As noted above, the '054 Specification does not use the term "carrier member" nor does it provide any structure corresponding to a "carrier member."

Pet. 11 (citing *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (en banc in relevant part); *Kyocera Senco Indus. Tools Inc. v. Int'l Trade Comm'n*, 22 F.4th 1369, 1380 (Fed. Cir. 2022) (construing, as a means-plus-function limitation, the recitation of "a lifter member which moves a driver member away from an exit end of the mechanism")). We determine that Petitioner's analysis under §112(f) is inadequate and unpersuasive.

Independent claim 1 recites "a carrier member formed from a transparent material." Ex. 1001, 56:13. Independent claim 9 recites "a carrier member having a circular carrier profile and positioned over the circular rear opening." *Id.* at 57:20–21. Independent claim 15 recites "a carrier member protruding outward from an external surface of the housing member." *Id.* at 58:10–11. None of these phrases is written in the form of a "means for" performing a function, the Petition does not identify a recited function,[5] and Petitioner does not address the issue of whether the overall limitation recites adequate structure for performing any such function. *See*

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[5] On the conference call, Petitioner represented that "the Petition identifies carrying or supporting electrodes to be the function of the carrier member." Ex. 1051, 49:3–10 (citing Pet. 10–12). The cited section of the Petition quotes the Specification, not the claim. Pet. 10. However, the focus of a means-plus-function analysis is the function recited in the claim. *See* 35 U.S.C. § 112(f). And, the Petition associates the function of supporting the electrodes with "carrier assembly" not "carrier member." *See* Pet. 10–11 ("Petitioner interprets the claim term 'carrier assembly' according[ly] to mean any appropriate structure that supports the electrodes and, optionally, optical components.").

Dyfan, LLC v. Target Corp., 28 F.4th 1360, 1365 (Fed. Cir. 2022) ("The first step is to determine whether a claim limitation is drafted in means-plus-function format, which requires us to construe the limitation to determine whether it connotes sufficiently definite structure to a person of ordinary skill in the art."). Additionally, regardless as to whether "Courts have construed 'member' style claim terms as nonstructural" under the particular facts before those courts, it was incumbent upon Petitioner—particularly in light of the "carrier" modifier—to demonstrate that "carrier member" is a nonce term under the facts of the case before us, i.e. whether the term is a generic placeholder that a person of ordinary skill in the art of wearable electronic devices/watches would not recognize as a name for sufficiently definite structure. Pet. 11; *Williamson*, 792 F.3d at 1348 ("In making the assessment of whether the limitation in question is a means-plus-function term subject to the strictures of § 112, para. 6, our cases have emphasized that the essential inquiry is . . . whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure."); *see id.* at 1350 (explaining that a nonce word is a generic term "that reflect[s] nothing more than verbal constructs [that] may be used in a claim in a manner that is tantamount to using the word 'means' because they 'typically do not connote sufficiently definite structure' and therefore may invoke § 112, para. 6."); *see also Kyocera*, 22 F.4th 1380 (the court, in Petitioner's cited case, determining, as part of its analysis, that "[a] person of ordinary skill in the art would not understand the claimed 'lifter member' to have 'a sufficiently definite meaning as the name for a structure.'"). Accordingly, we determine that

Petitioner has not shown persuasively that "carrier member" is a means-plus-function term.

Petitioner also offers, in the alternative, a non-means-plus-function construction for "carrier member." Pet. 11–12. Petitioner contends that the Specification uses the similar term "housing member" to "mean a component of the housing," and, therefore, the term "carrier member" should be construed likewise as "a component of a carrier assembly." *Id.* (citing Ex. 1001, 7:28–30, Fig. 2C). Because, for the reasons given below, we determine that Petitioner has not established a reasonable likelihood of prevailing on its challenges under its proposed alternative construction of "carrier member," we determine that the claim term does not require express construction for purposes of this decision.

D. The Alleged Anticipation of Claims 9 and 13–15 by Rothkopf (Ground 1)

Petitioner alleges that claims 9 and 13–15 are anticipated by Rothkopf. Pet. 19–34 (addressing claim 9). Patent Owner argues that Petitioner has failed to show that Rothkopf discloses electrodes positioned on a carrier member as recited in the independent claims. *See* Prelim. Resp. 19–25. For reasons discussed below, we determine that Petitioner has not shown a reasonable likelihood that it would prevail in its anticipation challenge.

1. Rothkopf (Ex. 1005)

Rothkopf is "directed to a consumer product, which may include a portable or wearable electronic device that is configured to provide an expansive feature set integrated or incorporated into a compact form factor." Ex. 1005 ¶ 4. "[A] consumer product may integrate or combine multiple subsystems into a single device to provide a wide range of functionality,

including biometric sensing, touch-based user input, near-field communications, and other desirable features." *Id.*

"The device 100 . . . includes one or more biosensors 118 and may include optical and/or electronic biometric sensors that may be used to compute one or more health metrics." *Id.* ¶ 84. "[O]ne or more of the biosensors 118 may include a light source and a photodetector to form a photoplethysmography (PPG) sensor." *Id.* "One or more of the biosensors 118 may also be configured to perform an electrical measurement using one or more electrodes." *Id.* "Additionally or alternatively, one or more of the biosensors 118 may be configured to measure body temperature, exposure to UV radiation, and other health-related information." *Id.*

Rothkopf's Figure 7 is reproduced below.

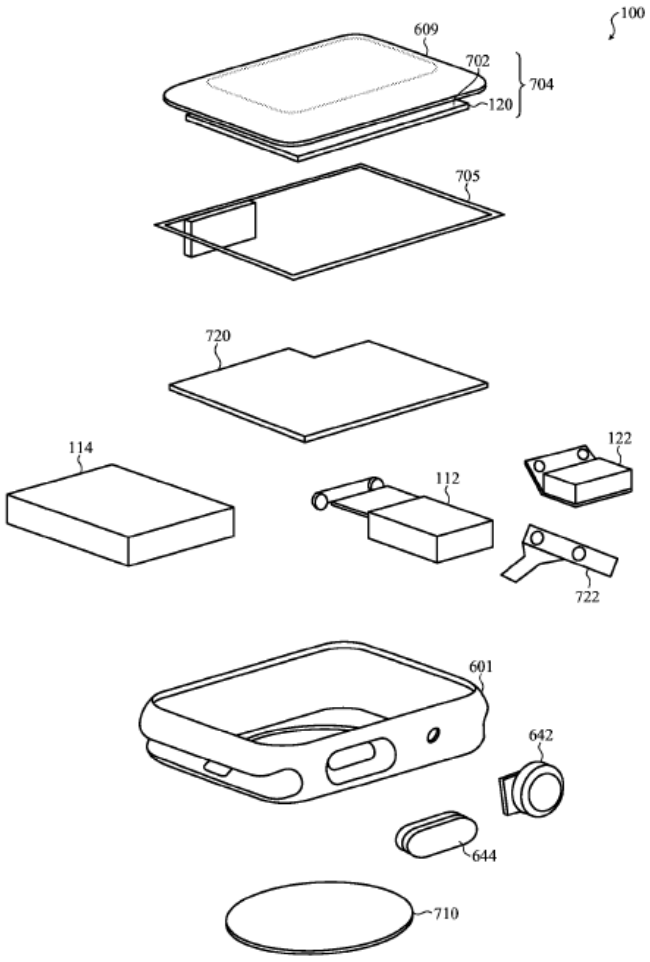


FIG. 7

Figure 7 "depicts an exploded view of components of an example wearable electronic device." *Id.* ¶ 35. "In the example depicted in FIG. 7, a biosensor module 710 is disposed in an opening formed in the rear surface of the housing 601." *Id.* ¶ 148. "In some embodiments, the biosensor module 710 includes the rear cover 608." *Id.*

"[D]evice 100 may include various sensors for measuring and collecting data that may be used to calculate a health metric or other health-related information." *Id.* ¶ 190. Rothkopf's Figure 16 is reproduced below.

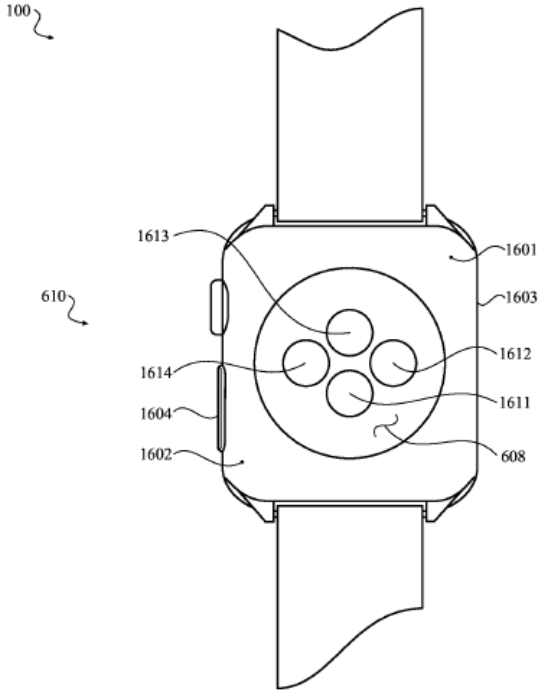


FIG. 16

Figure 16 "depicts an example device having biosensors." *Id.* ¶ 44. In this example, device 100 "include[s] an array of light sources 1611–1613 and a detector 1614 that are configured to function as an optical sensor or sensors." *Id.* ¶ 190. "[T]he device 100 may also include one or more electrodes to measure electrical properties of the user's body." *Id.* ¶ 196. "In this example [of Figure 16], a first electrode 1601 and second electrode 1602 are disposed on the rear face of the device 100." *Id.*

Rothkopf explains that:

> In some embodiments, some or all of the biosensors may be integrated into a module that is separate from and attached to the housing 601 of the device 100. As described above with respect to FIG. 6, in some embodiments, the biosensors are disposed relative to or attached to a rear cover 608 that is formed from an optically transparent material and is configured to be positioned with the opening of the housing 601. . . . [T]he rear cover 608 may include an array of windows, each window

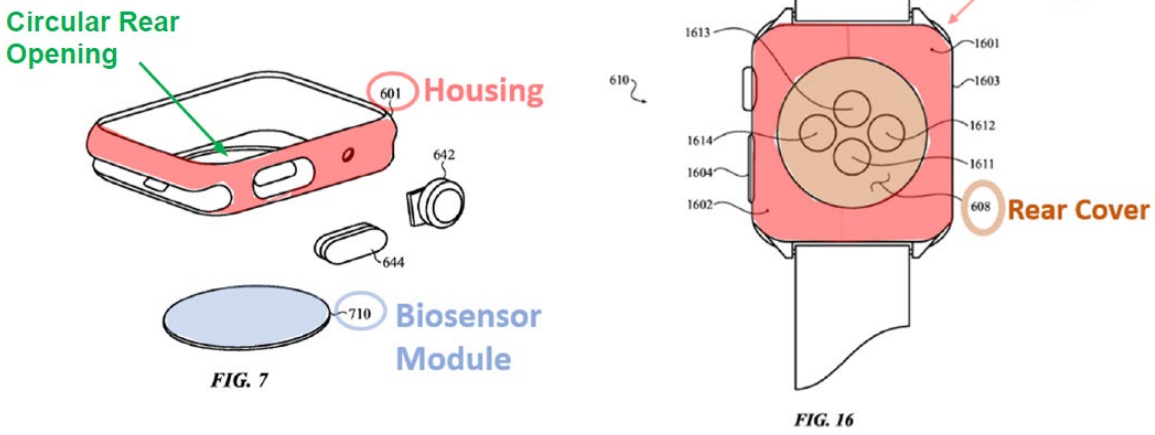
including an aperture or opening for a respective light source 1611–1613 and/or the detector 1614.

Id. ¶ 201.

2. Discussion

Independent claim 9 recites "a carrier assembly coupled to the rectangular housing member and comprising: a carrier member having a circular carrier profile and positioned over the circular rear opening." Ex. 1001, 57:18–21 (limitations 9e and 9f). Limitation 9g calls for "a rear electrode positioned on the carrier member and configured to receive a first voltage signal from a wrist of a user." *Id.* at 57:22–24. Independent claim 15 similarly recites "a rear electrode positioned on the carrier member." *Id.* at 58:12.

Reproduced below are Rothkopf's Figures 7 and 16 as annotated by Petitioner.



Pet. 22. Above, on the left, is a portion of Rothkopf's Figure 7, which is an exploded view of the device components, with Petitioner's annotations of housing 601 (red), opening in the rear surface of the housing (green), and biosensor module 710 (blue). Pet. 22; Ex. 1005 ¶¶ 35, 148. Above, on the right, is Rothkopf's Figure 16, which is an example of a device having

biosensors, with Petitioner's annotations of housing 601 (red; element number not shown) and rear cover 608 (orange). Pet. 22; Ex. 1005 ¶¶ 44, 148. Also shown in Figure 16 is an optical sensor having an array of light sources 1611–1613 and a detector 1614. As Petitioner acknowledges, "[i]n the embodiment of Fig. 16, electrodes 1601 and 1602 are not located on the biosensor module." Pet. 42. Rather, electrodes 1601 and 1602 are shown on the rear face of the housing. Ex. 1005 ¶ 196, Fig. 16.

Petitioner contends that Rothkopf's biosensor module 701 (blue in the figure above) is the recited "carrier assembly" and that rear cover 608 (orange) is the recited "carrier member." Pet. 22. Petitioner further contends that:

> Rothkopf discloses its "biosensor module 710 may include . . . one or more electrodes or conductive elements that are configured to detect and measure a physiological condition or property of the user." EX1005, [0148]. As noted above, "biosensor module 710 includes the rear cover 608." *Id.*, [0148]. Rothkopf further discloses that its "biosensors are disposed relative to ***or attached to*** a rear cover 608[.]" *Id.*, [0201] (emphasis added). Rothkopf explains its "biosensors" can be an electrode configured to perform an ECG measurement. *Id.*, [0084]. Rothkopf further confirms that its "device may also include at least one pair of electrodes disposed on an exterior surface of the wearable electronic device." *Id.*, [0024]. Rothkopf discloses the electrodes "make contact with the skin of the user's wrist when the device is being worn." *Id.*, [0196]; EX1003, ¶ 54.
>
> . . .
>
> Accordingly, Rothkopf discloses a rear electrode positioned on the carrier member (rear cover 608) . . . . EX1003, ¶ 54–56.

Id. at 23 (first alteration in original).

We find to be persuasive Patent Owner's argument that "the Petition fails to cite anything in Rothkopf that describes electrodes attached to the

'rear cover 608.'" Prelim. Resp. 23. Rothkopf discloses several embodiments of varying configurations. *See, e.g.*, Ex. 1005 ¶¶ 4–27. Petitioner, in the block quoted contention above, stitches together several statements from various points in the Specification that individually are correct descriptions of an aspect of a particular embodiment or example but, together, fail to constitute a disclosure of an embodiment having electrodes positioned on the rear cover. For example, Rothkopf, in the paragraph 148 cited by Petitioner, states that "[i]n some embodiments, the biosensor module 710 includes the rear cover 608" and, "[a]s described in more detail . . . with respect to FIG. 16, the biosensor module 710 *may* include one or more light sources, one or more photodetectors, and one or more electrodes or conductive elements." Ex. 1005 ¶ 148 (emphasis added). Thus, the biosensor module (mapped to the carrier assembly, not the carrier member) might include a rear cover and might include an electrode. It does not necessarily follow, however, that the electrode, when present, is positioned on the cover (mapped to the carrier member).

Petitioner points to Rothkopf's paragraph 201 as support for the proposition that "Rothkopf describes an embodiment where the electrodes are positioned on the cover 608." Pet. 42 (citing Ex. 1005 ¶ 201). That paragraph provides that, "[a]s described above with respect to FIG. 6, in some embodiments, the biosensors are disposed relative to or attached to a rear cover 608 that is formed from an optically transparent material and is configured to be positioned with the opening of the housing 601." Ex. 1005 ¶ 201. The paragraph does not describe an electrode as an exemplary biosensor in such embodiments. Rather, the paragraph goes on to describe the rear cover's use with light sources 1611–1613 and detector 1614, i.e.

optical sensor components. *See id.* ("The convex curved area of the rear cover 608 may include one or more windows or apertures that provide operational access to one or more internal components located within the housing. For example, the rear cover 608 may include an array of windows, each window including an aperture or opening for a respective light source 1611–1613 and/or the detector 1614."). This description is consistent with Figure 16, which is relied on by Petitioner, where those optical sensor components are positioned on or under rear cover 608 (shaded orange in Petitioner's annotated figure above) while electrodes 1601 and 1602 are positioned on the rear face of the housing (shaded in red) and thereby contact the user's skin. *See* Ex. 1005 ¶¶ 190, 196 ("In this example [of Figure 16], a first electrode 1601 and second electrode 1602 are disposed on the rear face of the device 100. The first 1601 and second 1602 electrodes may be configured to make contact with the skin of the user's wrist when the device is being worn.").

We determine that Petitioner has not shown adequately that a person of ordinary skill in the art would understand Rothkopf to disclose an electrode positioned on the carrier member, as recited in independent claims 9 and 15 and, by extension, claims 13 and 14, which depend from independent claim 9. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing on its anticipation challenge (Ground 1).

E. The Alleged Obviousness of Dependent Claim 10 Over Rothkopf, Francis, and Lapetina (Ground 1A)

For claim 10, which depends from independent claim 9, Petitioner again relies on Rothkopf for the purported disclosure of electrodes positioned on the carrier member. Pet. 35. Petitioner contends that Francis and Lapetina contain teachings regarding the use of an electrode as a ground.

Pet. 35–37. Petitioner's challenge to this dependent claim does not overcome the deficiencies discussed above with respect to independent claim 9. Accordingly, for the same reasons discussed above in connection with claim 9, we determine Petitioner has not met its burden to show a reasonable likelihood that claim 10 is unpatentable over the combination of Rothkopf, Francis, and Lapetina (Ground 1A).

F. The Alleged Obviousness of Claims 1–6, 9, 12–17, and 19 Over Rothkopf and Jung (Ground 2)

This Ground 2 applies to all three challenged independent claims 1, 9, and 15. Claim 1 calls for two "electrode[s] positioned on the carrier member." Ex. 1001, 56:14–17. Specifically, limitation 1f recites, in pertinent part, "a first electrode positioned on the carrier member." *Id.* at 56:14. Limitation 1g recites, in pertinent part, two requirements for the second electrode: "a second electrode positioned on the carrier member, . . . [and] the first and second electrodes at least partially surrounding a first region of the carrier member and a second region of the carrier member." *Id.* at 56:17–22. The light emitter and receiver are positioned below those regions of the carrier member. *Id.* at 56:23–27 (limitations 1h and 1i).

For the requirement of limitation 1f and the first requirement of limitation 1g—the positioning of the electrodes on the carrier member—Petitioner contends, in a manner similar to that of Ground 1, that Rothkopf discloses electrodes positioned on a carrier member (mapped to Rothkopf's rear cover 608). Pet. 40–41. For the reasons discussed above in the context of Ground 1, we determine that Petitioner has not adequately demonstrated that this contention is correct.

Petitioner further asserts that "Rothkopf . . . does not illustrate the exact configuration of the electrodes located on the biosensor module,"

referring to the second requirement of limitation, which calls for the two electrodes to each partially surround a respective region of the carrier member. Pet. 41. Petitioner contends that Jung discloses that "the electrodes can wrap around the edges of a carrier member that includes an optical PPG [photoplethysmography] sensor in a central location of the carrier member." *Id.* at 45 (citing Ex. 1003 ¶ 87). Petitioner's proposed modification is to arrange the electrodes purportedly already positioned on Rothkopf's rear cover (carrier member) so as to be at the edges and wrap around regions of that cover. *See id.* at 45–46. Accordingly, Petitioner does not articulate an obviousness ground that cures the underlying defect of the anticipation challenge of Ground 1.

As discussed above in the context of Ground 1, independent claims 9 and 15 recite "a rear electrode positioned on the carrier member." Petitioner's contentions regarding independent claims 9 and 15 are similar to that for independent claim 1, and likewise rely on the unpersuasive contention, made in Ground 1, that Rothkopf discloses an electrode positioned on the rear cover (carrier member). *See* Pet. 55–58, 63–65.

Each of the remaining challenged claims of this ground depends from one of independent claims 1, 9, or 15, and, thus, contains the requirement of an electrode on the carrier member. Petitioner's challenges to these dependent claims do not overcome the deficiencies discussed above with respect to independent claims. *See* Pet. 50–55, 59–62, 67–68.

Petitioner has not demonstrated a reasonable likelihood of prevailing on its challenge to claims 1–6, 9, 12–17, and 19 as being obvious over Rothkopf and Jung (Ground 2).

G. The Alleged Obviousness of Dependent Claims 7 and 20 Over Rothkopf, Jung, and Pei (Ground 2A)

The Alleged Obviousness of Dependent Claim 8 Over Rothkopf, Jung, and Honda (Ground 2B)

The Alleged Obviousness of Dependent Claims 10–11 and 18 Over Rothkopf, Jung, Francis, and Lapetina (Ground 2C)

Each of claims 7–8, 10–11, 18, and 20 depend from one of the independent claims addressed above in the context of Ground 2. Petitioner's challenges to these dependent claims do not overcome the deficiencies discussed above with respect to those independent claims. *See* Pet. 68–74. Accordingly, for the same reasons discussed above, we determine Petitioner has not met its burden to show a reasonable likelihood that: claims 7 and 20 would have been obvious over Rothkopf, Jung, and Pei (Ground 2A); claim 8 would have been obvious over Rothkopf, Jung, and Honda (Ground 2B); and claims 10–11 and 18 would have been obvious over Rothkopf, Jung, Francis, and Lapetina (Ground 2C).

H. The Alleged Obviousness of 1–5, 9, 13–16, and 19 Over Rothkopf and Paulke (Ground 3)

Like Ground 2, this Ground 3 applies to all three independent challenged claims. And, also like Ground 2, Petitioner relies on the unpersuasive contention that Rothkopf discloses electrodes positioned on the carrier member. *See, e.g*, Pet. 75 (for limitation 1g: "As explained above in limitation 1f of Ground 2, Rothkopf discloses a second electrode ('pair of electrodes') positioned on the carrier member (rear cover 608)."), 79 ("Rothkopf teaches this [rear electrode positioned on the carrier member] limitation as explained above with regard to limitation 9g of Ground 1."), 84 ("Rothkopf teaches this limitation as explained above with regard to Claim 15e of Ground 2."). Similar to Ground 2, Petitioner relies on the secondary

reference, here Paulke, for teachings regarding arranging electrodes purportedly already positioned on the rear cover so that they partially surround regions and, thus does not articulate an obviousness ground that cures the underlying defect of the anticipation challenge of Ground 1. *See, e.g.*, *id.* at 76–78. Petitioner's challenges to the dependent claims also do not overcome the deficiencies discussed above with respect to independent claims. *See id.* at 79, 83, 87.

Petitioner has not demonstrated a reasonable likelihood of prevailing on its challenge to claims 1–5, 9, 13–16, and 19 as being obvious over Rothkopf and Paulke (Ground 3).

I. The Alleged Obviousness of Dependent Claims 7 and 20 Over Rothkopf, Paulke, and Pei (Ground 3A)

The Alleged Obviousness of Dependent Claim 8 Over Rothkopf, Paulke, and Honda (Ground 3B)

The Alleged Obviousness of Dependent Claims 10–11 and 18 Over Rothkopf, Paulke, Francis, and Lapetina (Ground 3C)

Petitioner's challenges to these dependent claims do not overcome the deficiencies discussed above with respect to those independent claims. *See* Pet. 87–88 (relying on the reasons given for the corresponding ground involving Jung). Accordingly, for the same reasons discussed above, we determine Petitioner has not met its burden to show a reasonable likelihood that: claims 7 and 20 would have been obvious over Rothkopf, Paulke, and Pei (Ground 3A); claim 8 would have been obvious over Rothkopf, Paulke, and Honda (Ground 3B); and claims 10–11 and 18 would have been obvious over Rothkopf, Paulke, Francis, and Lapetina (Ground 3C).

V. CONCLUSION

Petitioner has not demonstrated that there is a reasonable likelihood of establishing the unpatentability of any of claims 1–20 of the '054 patent.

VI. ORDER

For the foregoing reasons, it is

ORDERED that the Petition is *denied* and no trial is instituted.

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Patent 10,987,054 B2

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